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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,613	10/16/2001	Paul L. Sinclair	9792	5753

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EXAMINER

BLACK, LINH

ART UNIT	PAPER NUMBER
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2177

DATE MAILED: 03/29/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

Application No.

09/981,613

Applicant(s)

SINCLAIR ET AL.

Examiner

LINH BLACK

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8 and 12 is/are rejected.
- 7) ☒ Claim(s) 7, 9-11, 13-14 is/are objected to.
- 8) ☒ Claim(s) 1-37 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-14, drawn to data structure, classified in class 707, subclass 100.
  - II. Claims 15-30, drawn to building or generating database, classified in class 707, subclass 102.
  - III. Claims 31-37, drawn to manipulating data structure (storing a row identification), classified in class 707, subclass 101.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I-III are related as sub-combinations disclosed as usable together in a single combination. The sub-combinations are distinct from each other if they are shown to be separately usable. In the instant case, each of the respective inventions has a separate utility other than with the other invention. See MPEP § 806.05(d).
3. Because these inventions are distinct for the reasons given above and the search required for group I is not required for the other groups, restriction for examination purposes as indicated is proper.

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4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
6. Applicants elected group I with traverse on Wednesday 17, 2004.

### ***Drawings***

7. The drawings are objected to under 37 CFR 1.84(o) because they fail to show necessary textual labels of features in Fig. 1, element 100; fig. 2, elements 200-220; fig. 3, elements 120 and 310-330; fig. 4, elements 400-406; fig. 5, elements 500-560; fig. 6, elements 600-630; fig. 7, elements 710-720; and fig. 8, element 810, as described in the specification. For example, placing the label, "database system" with element 100 of fig. 1; "table" with element 200 or "column" with elements 210 or 220; or "the row ID" with element 400 of fig. 4 etc... would give viewers a clear understanding of the drawing. A descriptive textual label for each numbered element in these figures would be needed to fully and better understand these figures without any substantial analysis of the detailed specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or

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corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

8. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, claim 7's limitation: "the third value is a uniqueness number", claim 9's limitation: "the first value of the row ID corresponds to ranges of values in a column", claim 10's limitation: "wherein the ranges of values in a column are ranges of dates", and claim 13's limitation must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-2, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kruglikov et al. (USP 6105026), and further in view of Tow et al. (USP 5860070).

2. As per independent claim 1, Kruglikov et al. teach:

“a plurality of storage facilities, each storage facility including data representing a plurality of table rows” - fig. 1, elements 110-130; col. 1, lines 1-26.

“wherein table rows in each storage facility that correspond to a specific table are logically ordered according to a row identifier (row ID)” – fig. 1 (id#, partitioning key 102); col. 1, lines 20-26 . Kruglikov et al. do not explicitly suggest: “row ID comprises a first value based on one or more columns of the table and a second value based on one or more columns of the table; and the first value of the row ID is predominate in determining the order of the rows in the storage facilities and the second value determines the order of those rows with identical first values”. Tow et al. teach “method and apparatus of enforcing uniqueness of a key value for a row a data table” – the title. Tow et al. teach: “row ID comprises a first value based on one or more columns of the table and a second value based on one or more columns of the table” – fig. 4, element 410; col. 3, lines 31-46. Tow et al. also teach: “the first value of the row ID is predominate in determining the order of the rows in the storage facilities and the second value determines the order of those rows with identical first values” – col. 2, lines 47-56. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Kruglikov et al.’s teaching with Tow et al.’s teaching of multi-column key in order to efficiently enforce the row uniqueness for each table partition or storage facility.

3. As per claim 2, Kruglikov et al. do not explicitly suggest: “the row ID further

comprises a third value and the third value determines the order of rows with identical first and second values". Tow et al. teach multi-column keys – fig. 4. Tow et al. further teach: for example in figure 2, no two customer number rows should have the same value. However, but if the customer number value is the same for two different rows, adding more column (the customer name column) to the key column is needed to make the customer table key unique. Therefore, if the values of the customer number and customer name are the same for any two different rows, adding a third column to the key column will be needed in order to make the customer table key unique. The third value helps differentiate the rows having equal first and second values. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Kruglikov et al.'s teaching with Tow et al.'s teaching of multi-column key in order to efficiently enforce the row uniqueness for each table partition or storage facility.

4. As per claim 12, Applicants do not explicitly disclose the limitation "the specified column" in the specification. Kruglikov et al. do not explicitly suggest "the second value is a value in a specified column". Hence, Examiner interprets "specified column" is the column that is assigned to the second value row id. Tow et al. teach "the second value is a value in a specified column" – col. 2, lines 41-67 (customer name).

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5. Claims 3-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kruglikov et al. (USP 6105026), further in view of Tow et al. (USP 5860070), Greene et al. (USPAP 2002/0165727), and Pyne (USP 5721907).
6. As per claims 3-6 and 8, Kruglikov and Tow et al. do not explicitly suggest: "the row ID is 64 bits". However, Greene et al. teach "method and system for managing partitioned data resources" – the title. Greene et al. also teach "one of the main roles of this central manager is to provide coordination and management of unique primary keys (PKs) across all partitions. In the present architecture, all entities follow the convention of defining a candidate primary key consisting of a unique 64-bits integer called the UID (unique identifier)" – page 37, paragraph 0326. Pyne teaches "FIGS. 7A-7C illustrate a second exemplary embodiment for calculating keys in accordance with the invention in which the range of possible key values is extended beyond the summing scheme of FIG. 5, thereby decreasing the likelihood that any key value will be representative of more than a single block of data. Further, the calculation method allows the current key to be updated very quickly, as described in FIG. 7C and accompanying text. The examples of FIGS. 7A-7C illustrate a 32-bit key, but it will be appreciated that other key sizes may be implemented. With reference to FIG. 7A, the 32-bit key is divided into a lower 24-bit segment and an upper 8-bit segment." – col. 8, lines 5-16. Pyne also teach: "If it is assumed that each block of data is 256 bytes, under the key computation method described in FIG. 5, the range of possible key values is 0 to 65,280, the latter value occurring only if each byte in the block has a numerical value of 255. The odds of



having duplicate keys are significantly decreased if: (1) the range of possible key values is relatively large, and/or (2) the likelihood that key computations will fall within a broader portion of the range is increased" col. 7, lines 45-53. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to assign an appropriate number of bits to the row id: 64 bits or 80 bits etc...which would best serve the purpose of the row id and also would accommodate the key columns' sizes within the multicolumn row id and the task at hand in order to efficiently keep rows in each storage facility unique.

***Allowable Subject Matter***

7. Claims 7, 9-11, 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims:

Applicants disclose row id fields in figure 4. The first field 402 is the partition value, the second field 404 is the hash value, and the third field 406 is the uniqueness value. Prior art does not explicitly teach the combination of specific fields within a partitioned row id that corresponding to specific value types.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LINH BLACK whose telephone number is 703-305-0317. The examiner can normally be reached on Monday-Thursday from 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN BREENE can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306, for Before Final communications: 703-746-7239, and for After Final communications: 703-746-7238.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-746-7240.

*Linh Black*

LINH BLACK  
Patent Examiner  
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